How Pesticides are Regulated to Protect Ground Water

Department of Pesticide Regulation
Environmental Monitoring Branch

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Ground Water Protection Regulations

in Agricultural, Outdoor Industrial, and Outdoor Institutional Use Settings
Title 3, California Code of Regulations Division 6

This handout describes the Department of Pesticide Regulation's (DPR's) ground water protection regulations. They became effective May 27, 2004. We will review:

- The pesticides that have been found in ground water due to legal agricultural use.
- The conditions and pathways that lead to ground water contamination.
- How to identify areas that are vulnerable to pesticide movement to ground water.
- The management practices that are designed to minimize pesticide movement to ground water.

Pesticides found in ground water

These seven currently registered pesticides have been found in California ground water due to legal agricultural use:

atrazine	prometon
simazine	bentazon
bromacil	norflurazon.
diuron	

All are listed in Title 3, California Code of Regulations (3CCR) section 6800(a). For ease of explanation in this handout, we will refer to them as "listed pesticides." (Pesticides with the potential to move to, but not found in, ground water are listed in 3CCR section 6800[b].)

Conditions and pathways associated with pesticide movement to ground water

Years of study and analysis by DPR scientists have shown that pesticides move to ground water under certain soil conditions, and are more frequently found when depth to ground water is shallower than 70 feet. Certain coarse soils and hardpan soils are the principal soil classifications associated with ground water contamination, and are regulated to protect ground water. These general soil categories are each associated with a different pathway to ground water.

Leaching

In coarse, sandy soils, leaching is the principal pathway. Field studies have shown that because of the relatively low amounts of rainfall in most agricultural areas of California, irrigation is the main source of water that moves pesticides to ground water through leaching.

Runoff

In hardpan soils, the principal pathway is runoff to dry wells, ditches, sumps or ponds, soils with deep cracks, or coarse soil areas. Since most applications of listed pesticides are from late fall to early spring, rainfall, not irrigation, is the main source of water that moves pesticides to ground water through runoff.

Leaching and runoff pathways each require different management practices to protect ground water (see below).

Areas vulnerable to pesticide movement to ground water

Through its studies, DPR has identified areas of the State vulnerable to pesticide movement to ground water. These vulnerable areas are called ground water protection areas (GWPAs). They are listed by county, base meridian, township, range, and section in a document referenced in the regulation. All sections of land where pesticides have been found in ground water due to legal agricultural use are designated as either leaching or runoff GWPAs. Additional sections of land are designated as GWPAs because they contain either certain coarse soils or hardpan soils associated with pesticide movement to ground water and they have an average depth to ground water of 70 feet or less. There are GWPAs in 34 of the State's 58 counties (3CCR section 6000).

Information on GWPAs is available on DPR's Web site as lists, maps, and shapefiles.

Locations of GWPAs are also available from:

- County Agricultural Commissioners (CACs)
- DPR's Environmental Monitoring Branch, (916) 324-4086

Restricted material permits and certification requirements

All agricultural, outdoor industrial, and outdoor institutional uses of products containing listed pesticides are treated as a restricted material use. However, listed pesticides require a restricted materials permit only when used inside GWPAs (unless the pesticide is restricted for purposes other than ground water protection). Also, since listed pesticides are restricted materials statewide, they may only be applied by or under the supervision of a certified applicator both inside and outside GWPAs (3CCR section 6416).

Statewide use restrictions

The following restrictions apply to listed pesticides statewide (inside and outside GWPAs):

Artificial recharge basins: Do not apply below the high water line inside artificial recharge basins, unless the pesticide is applied six months or more before the basin is used to recharge ground water (3CCR section 6487.1).

Canal and ditch banks: Do not apply below the high water line inside canals and ditches, unless you can document either that:

(a) The percolation rate of the canal or ditch is equal to or less than 0.2 inches per hour, **OR**
(b) The pesticide is applied six months before water is run in the canal or ditch (3CCR section 6487.2).

Restrictions in runoff GWPAs (except on engineered rights-of-way)

Use of listed pesticides is prohibited in runoff GWPAs unless one of the following management practices can be met and is designated by CACs on the permit:

(a) Apply the pesticide as a band treatment immediately adjacent to the crop row so that not more than 33 percent of the distance between rows is treated (for citrus, the band may extend out to the drip line of the tree); **OR**
(b) Disturb the soil to be treated that is outside of the 33 percent band, or outside the dripline in citrus, by using a disc, harrow, rotary tiller, or other mechanical method within seven days before the pesticide is applied (not an option for bentazon); **OR**
(c) Incorporate the pesticide on at least 90 percent of the area treated outside of the 33 percent band, or outside of the dripline in citrus, within 48 hours after the day the pesticide is applied. Incorporation may be by mechanical methods, such as by using a disc, harrow, or rotary tiller, or by sprinkler or low flow irrigation (1/4–1 inch of water

applied at a rate that does not cause runoff), including chemigation if allowed by the label (not an option for bentazon); **OR**

(e) Apply the pesticide between April 1 and July 31; **OR**

(f) Retain all irrigation runoff, and all precipitation, and drainage through, the field for six months following the application. If a retention area (sump) is used, its percolation rate shall not exceed 0.2 inches per hour unless the runoff water is completely recirculated onto the treated field or an adjacent field every 24 hours; **OR**

(g) Channel the runoff to a retention area off the application site. The retention area must be under the control of the property operator. The retention area must also be designed to retain all irrigation runoff, precipitation, and drainage through the treated field and all other areas draining into that retention area, for six months following the application. The percolation rate of the retention area shall not exceed 0.2 inches per hour; **OR**

(h) For 6 months following application, runoff shall be managed so that it runs off onto an adjacent unenclosed fallow field at least 300 feet long that is not irrigated for 6 months after application, with full consideration of any plant back restrictions; **OR**

(i) For the tops and land side banks of canals, and rights-of-way, no additional management practice is required if runoff flows onto adjacent land equal in size to the treated area, where it infiltrates and does not move to structures such as dry wells, ditches or excavated retention areas with percolation rates of greater than 0.2 inches per hour (3CCR section 6387.4, as amended by Enforcement Letters ENF 04-22 and ENF 05-06).

Restrictions in leaching GWPAs (except on engineered rights-of-way)

Use of listed pesticides is prohibited in leaching GWPAs unless any one of the following management practice options can be met and is designated by CACs on the permit:

(a) Do not apply any irrigation water for six months following application of the pesticide; **OR**

(b) Apply the pesticide to the planting bed or the berm so that it is not contacted by irrigation water in the furrow or basin for six months following application of the pesticide; **OR**

(c) Manage the irrigation so that the amount of irrigation water applied does not exceed the net irrigation requirement multiplied by 1.33 for six months following application of the pesticide (3CCR section 6487.5).

Efficient irrigation

Property managers are more likely to irrigate efficiently in leaching GWPAs when they:

- Use a pressurized irrigation system (sprinkler or low flow).
- Schedule irrigations based on soil moisture levels, measured plant water status, or calculated evapotranspiration (ET) since the last irrigation.
- Calculate the amount of water to apply in each irrigation based on the effective plant root depth, the soil water holding capacity, and the soil moisture level; or evapotranspiration since the last irrigation
- Know how much water was applied per acre based on one of the following:
  - A water meter, **OR**
  - An accurate measurement of the pump output per hour multiplied by hours run per acre, **OR**
  - An accurate measurement of sprinkler/low flow output per hour per acre, multiplied by hours run, **OR**
  - An accurate measurement of the turnout rate per hour, multiplied by hours run per acre.

Restrictions on engineered rights-of-way within GWPAs

"***Engineered rights-of-way***" means areas within a GWPA that are constructed in a way that results in increased collection and runoff of storm water, such as railroad ballasts and berms, public roadsides, and highway median strips or similar areas, but not canal or ditch banks or utility lines. Use of listed pesticides is prohibited on engineered rights-of-way in leaching or runoff GWPAs unless one of the following management options can be met and is designated by the commissioner on the permit:

(a) Comply with any of the runoff GWPA management practices; **OR**

(b) Manage any runoff from the treated right-of-way so that it passes through a noncrop fully vegetated area adjacent and equal in area to the treated area; **OR**

(c) Comply with any permit issued pursuant to the storm water provisions of the federal Clean Water Act pertaining to the treated area (3CCR section 6487.3 as amended by Enforcement Letter ENF 05-06).

Alternative management practices or interim use approved by DPR

Pesticide users may submit a request to DPR to use alternative, equivalent management practices. If approved by DPR, these can be substituted for management practices specified for runoff and leaching GWPAs, or for engineered rights of way within GWPAs. Under certain conditions, pesticide users may also request approval from DPR for interim use of listed pesticides with no ground water restrictions, (3CCR sections 6487.3[d], 6487.4[h], and 6487.5[d]).

Wellhead protection

This applies to all pesticides mixed, loaded, rinsed, or stored, (but not applied, except as noted) around any type of well, including municipal, domestic, irrigation, drainage, abandoned, and monitoring wells. Wells are either protected from runoff or not protected from runoff.

(a) ***Wells protected from runoff*** must be sited so that runoff water from irrigation or rainfall does not move from the perimeter of the wellhead toward the wellhead and contact or collect around any part of the wellhead including the concrete pad or foundation. Alternately, wells must be protected from runoff by a berm constructed of any material sufficient to prevent movement of surface runoff water from the perimeter of the wellhead to the wellhead. Application of preemergent pesticides listed in either 3CCR sections 6800(a) or (b) www.cdpr.ca.gov/docs/inhouse/calcode/040101.htm#a6800 is prohibited between the berm and the wellhead; **OR**

(b) ***Wells not protected from runoff***. These activities are prohibited within 100 feet of a well not protected from runoff:

- Mixing, loading, and storage of pesticides.
- Rinsing of spray equipment or pesticide containers.
- Maintenance of spray equipment that could result in spillage of pesticide residues on the soil.
- Application of a preemergent herbicide listed in 3CCR section 6800(a) or (b) (3CCR section 6609 as interpreted in Enforcement Letter ENF 05-24).

More information

- Get more information about the ground water protection program on DPR's Web site at: www.cdpr.ca.gov/docs/gwp/index.htm
- Questions? Call DPR's Environmental Monitoring Branch, (916) 324-4086.